Sodium intake in Germany

Abstract
For many years, a high sodium intake has been discussed as a potential risk factor in the development of hypertension and, consequently, cardiovascular diseases. As part of the German Health Interview and Examination Survey for Adults (DEGS1), which was conducted between 2008 and 2011, sodium excretion in casual urine samples was used as a biomarker to measure sodium intake. DEGS1 observed that the median daily sodium intake of women (3.4 g) as well as men (4.0 g) exceeds the levels recommended by German and international organisations. Among other factors, men’s higher sodium intake could be explained by their higher energy intake. In addition, DEGS1 demonstrates an association between women’s sodium intake and age; however, no equivalent correlation was identified for men. Furthermore, although high socio-economic status is associated with lower sodium intake in men, no comparable correlation was observed among women.

Introduction
Sodium is an essential nutrient with important functions in the body [1]. It is a component of table salt, which is added to foods during processing, preparation, and immediately before eating. As such, processed foods, and especially bread, prepared meat products, and dairy products such as cheese, are the primary sources of sodium [2, 3].

A high sodium intake is associated with a risk of high blood pressure (hypertension) and is thereby indirectly related to the development of cardiovascular disease [4–10]. However, not all people respond with elevated blood pressure to high salt intake (salt sensitivity) [11, 12]. Further negative effects of a high sodium intake have also been discussed: these include a possible higher risk of stomach cancer and osteoporosis [13].

In order to compensate for daily losses of sodium, a minimum intake of 0.55 g per day for adults and young people is recommended [1]. The German Nutrition Society (DGE) has defined a guidance level of up to 6 g per day for table salt [14]. This is comparable to a teaspoon of salt and corresponds to a daily sodium intake of about 2.4 g.

A representative and regular assessment of the population’s sodium intake in Germany is an important means of assessing and developing practical approaches for the future.

Indicator
The amount of sodium that is excreted throughout the day is assumed to roughly correspond to a person’s daily sodium intake; as such, the amount of sodium measured in the urine constitutes a suitable biomarker to measure sodium intake. Casual urine samples were collected as part of the German Health Interview and Exam-
Sodium intake in Germany

Men tend to have a higher sodium intake than women; this is linked to men's higher dietary energy intake.

Reflection of the results

The German adult population has a median sodium intake of 3.7 g per day. The median intake of women (3.4 g) is lower than men (4.0 g) (Table 1). This means that 50% of the adult population in Germany has a daily sodium intake that is higher than this level. Sodium intake of 25% of women is 5.0 g per day or more; 25% of men have a sodium intake of 5.7 g per day or more (Table 1, 75th percentile); 5% of women consume more than 8.1 g of sodium per day; and 5% of men consume more than 8.8 g of sodium per day (Table 1, 95th percentile). The mean estimated daily sodium intake (3.8 g for women and 4.5 g for men) is higher than the corresponding median values. Men's higher sodium intake could be explained by their higher energy intake. In terms of units of energy, men and women in Germany have a similar sodium intake [16].

Women's sodium intake does increase until the 40-to-59 age group and decreases slightly in the older age groups. No such age-related trends have been observed among men.

<table>
<thead>
<tr>
<th>Age</th>
<th>P5 g/day</th>
<th>P10 g/day</th>
<th>P25 g/day</th>
<th>Median g/day</th>
<th>P75 g/day</th>
<th>P90 g/day</th>
<th>P95 g/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women (all)</td>
<td>1.1</td>
<td>1.5</td>
<td>2.3</td>
<td>3.4</td>
<td>5.0</td>
<td>6.7</td>
<td>8.1</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–29 years</td>
<td>1.0</td>
<td>1.3</td>
<td>2.0</td>
<td>2.9</td>
<td>4.2</td>
<td>5.9</td>
<td>7.0</td>
</tr>
<tr>
<td>30–39 years</td>
<td>1.3</td>
<td>1.5</td>
<td>2.3</td>
<td>3.3</td>
<td>4.7</td>
<td>6.4</td>
<td>7.8</td>
</tr>
<tr>
<td>40–49 years</td>
<td>1.3</td>
<td>1.6</td>
<td>2.6</td>
<td>3.8</td>
<td>5.2</td>
<td>7.1</td>
<td>8.5</td>
</tr>
<tr>
<td>50–59 years</td>
<td>1.1</td>
<td>1.5</td>
<td>2.4</td>
<td>3.7</td>
<td>5.4</td>
<td>7.0</td>
<td>8.0</td>
</tr>
<tr>
<td>60–69 years</td>
<td>1.1</td>
<td>1.5</td>
<td>2.1</td>
<td>3.4</td>
<td>4.8</td>
<td>6.7</td>
<td>7.9</td>
</tr>
<tr>
<td>70–79 years</td>
<td>0.9</td>
<td>1.3</td>
<td>2.1</td>
<td>3.1</td>
<td>5.0</td>
<td>6.6</td>
<td>8.6</td>
</tr>
<tr>
<td>Men (all)</td>
<td>1.2</td>
<td>1.7</td>
<td>2.7</td>
<td>4.0</td>
<td>5.7</td>
<td>7.6</td>
<td>8.8</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–29 years</td>
<td>1.5</td>
<td>1.8</td>
<td>2.6</td>
<td>3.9</td>
<td>6.0</td>
<td>7.9</td>
<td>8.7</td>
</tr>
<tr>
<td>30–39 years</td>
<td>1.1</td>
<td>1.8</td>
<td>2.9</td>
<td>4.2</td>
<td>6.1</td>
<td>8.2</td>
<td>9.2</td>
</tr>
<tr>
<td>40–49 years</td>
<td>1.0</td>
<td>1.5</td>
<td>2.6</td>
<td>3.8</td>
<td>5.3</td>
<td>6.9</td>
<td>8.6</td>
</tr>
<tr>
<td>50–59 years</td>
<td>1.3</td>
<td>1.9</td>
<td>2.7</td>
<td>4.1</td>
<td>5.9</td>
<td>7.8</td>
<td>9.0</td>
</tr>
<tr>
<td>60–69 years</td>
<td>1.3</td>
<td>1.7</td>
<td>2.7</td>
<td>4.1</td>
<td>5.7</td>
<td>7.6</td>
<td>9.6</td>
</tr>
<tr>
<td>70–79 years</td>
<td>1.2</td>
<td>1.7</td>
<td>2.6</td>
<td>3.9</td>
<td>5.5</td>
<td>7.6</td>
<td>8.6</td>
</tr>
<tr>
<td>Total</td>
<td>1.2</td>
<td>1.6</td>
<td>2.4</td>
<td>3.7</td>
<td>5.3</td>
<td>7.2</td>
<td>8.6</td>
</tr>
</tbody>
</table>

P = percentile

Table 1

Estimated sodium intake (percentile) for 18- to 79-year-olds according to gender and age (n=3,626 women, n=3,333 men)
Source: DEGS1 (2008–2011)
Women’s sodium intake is lower among younger and among the highest age groups.

Compared with recommendations made by national and international organisations, large parts of the German population consume too much sodium: 73% of women and 80% of men in Germany exceed the guidance level defined by the German Nutrition Society [14] of up to 6 g of table salt per day (equivalent to 2.4 g of sodium). Furthermore, 80% of women and 86% of men in Germany exceed the World Health Organization’s (WHO) [20] recommendation of a sodium intake of less than 2 g per day.

Since the daily sodium intake in many EU member states is higher than recommended levels, the WHO’s Action plan for implementation of the European Strategy for the Prevention and Control of Noncommunicable Diseases 2012–2016 declared the reduction of sodium intake to be one of its five priority areas for intervention [21].

Note

This fact sheet is based on information that appeared in the chapter “Sodium” published in the German Nutrition Society’s 13th Nutritional Report [22].

References


<table>
<thead>
<tr>
<th>Socio-economic status</th>
<th>Women g/day</th>
<th>Men g/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>3.4</td>
<td>4.0</td>
</tr>
<tr>
<td>Medium</td>
<td>3.5</td>
<td>4.1</td>
</tr>
<tr>
<td>High</td>
<td>3.4</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Table 2
Estimated sodium intake (median) among 18- to 79-year-olds according to gender and socio-economic status (n=3,602 women, n=3,309 men)
Source: DEGS1 (2008–2011)
Men with a high socio-economic status tend to have lower sodium intakes.

Sodium intake in Germany

Imprint

Journal of Health Monitoring

Author details
Robert Koch Institute
Department for Epidemiology and Health Monitoring,
Berlin, Germany

Corresponding author
Dr. Gert B.M. Mensink
Robert Koch Institute
Department for Epidemiology and Health Monitoring
General-Pape-Str. 62–66
D-12101 Berlin, Germany
E-mail: MensinkG@rki.de

Conflicts of interest
The authors declared no conflicts of interest.

Funding
The determination of sodium in urine was financially supported by the German Federal Ministry of Food and Agriculture (BMEL) through the Federal Office for Agriculture and Food (BLE), grant number 2813HS013.

Publisher
Robert Koch Institute
Nordufer 20
D-13353 Berlin, Germany

Editors
Dr. Franziska Prütz, Martina Rabenberg,
Alexander Rommel, Dr. Anke-Christine Saß,
Stefanie Seeling, Martin Thissen,
Dr. Thomas Ziese
Robert Koch Institute
Department for Epidemiology and Health Monitoring
General-Pape-Str. 62–66
D-12101 Berlin
Phone: +49 (0)30-18 754-3400
E-mail: healthmonitoring@rki.de
www.rki.de/journalhealthmonitoring-en

Please cite this publication as
DOI 10.17886/RKI-GBE-2016-041

This work is licensed under a Creative Commons Attribution 4.0 International License.